

R E M A R K S

Careful review and examination of the subject application are noted and appreciated.

Please cancel claim 13 without prejudice. Please add new claims 26 and 27.

SUPPORT FOR THE CLAIM AMENDMENTS

Support for the claim amendments may be found in the specification, for example, on page 20 line 18 to page 21 line 10 and FIG. 5 as originally filed, and claims 15 and 16 as previously presented. Thus, no new matter has been added.

OBJECTION TO THE CLAIMS

The objection to claims 13-16 under 37 CFR 1.75(c) is respectfully traversed and should be withdrawn. 37 CFR 1.126 states:

When the application is ready for allowance, **the examiner**, if necessary, will renumber the claims consecutively in the order in which they appear or in such order as may have been requested by applicant. (Emphasis added)

Since the Examiner is responsible for renumbering the claims after allowable subject matter is indicated, presenting the objection to the Applicants is inappropriate and the objection should be withdrawn.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

The rejection of claims 1, 10, 11 and 21-25 under 35 U.S.C. §103(a) as being unpatentable over Hanami et al., Japanese Patent Application Pub. 2000-308064 (hereafter Hanami) relying on and citing corresponding US Pat. No. '965 for translation, in view of Yokoyama '660 and Official Notice has been obviated in part by amendment, is respectfully traversed in part, and should be withdrawn.

The rejection of claims 2, 4-6 and 20 under 35 U.S.C. §103(a) as being unpatentable over Hanami in view of Yokoyama, Official Notice and Arcoleo et al. '645 (hereafter Arcoleo) has been obviated in part by amendment, is respectfully traversed in part, and should be withdrawn.

The rejection of claims 7, 9, 13-16 and 19 under 35 U.S.C. §103(a) as being unpatentable over Hanami in view of Yokoyama, Official Notice and Topper, European Patent Application Pub. 1,143,712, has been obviated in part by amendment, is respectfully traversed in part, and should be withdrawn.

Hanami concerns a motion vector detecting apparatus (title). Yokoyama concerns a device and method of detecting motion vectors (title). Arcoleo concerns a random access memory having independent read port and write port and process for writing and reading from same (title). Topper concerns a method and apparatus for calculating motion vectors (title). Official Notice is taken

of the "equivalence of determining an offset relative to any point in a given image for their use in measuring additional relative distances from said point."

Claim 1, 11 and 20 are independently patentable over the cited references. Claim 1 provides that (i) the first offset comprises a small offset pointing to a first position in the first reference image, the first position being approximately co-located with a center of the first current block and (ii) the second offset comprises a large offset pointing to a second position in the first reference image, **the second position being distant from the first position and the second position corresponding to a global offset associated with fast moving data in the current image.** Claims 11 and 20 provide similar language. In contrast, the proposed combination of references does not appear to teach or suggest all of the above claim limitations.

In particular, the Office Action argues that Hanami teaches three motion vector searches performed by three motion detectors MD#1, MD#2 and MD#3 operating in parallel in three search areas SA1, SA2 and SA3. However, Hanami appears to be silent that the positions of search areas SA1 and SA3 are distant from the search area SA2. In particular, FIG. 11 of Hanami appears to teach that both of the search areas SA1 and SA3 are adjoining search area SA2, thereby forming **a single search area.** Hanami appears to be silent regarding searching for two motion vectors for a current

block in two distinct search areas in the same reference image. Neither Yokoyama or Official Notice appear to cure the deficiency of Hanami. Therefore, Hanami, Yokoyama and Official Notice, alone or in combination, do not appear to teach or suggest that the second position is distant from the first position, as presently claimed.

Furthermore, all of Hanami, Yokoyama and Official Notice appear to be silent regarding a second offset of a second search area corresponding to a **global offset** associated with fast moving data in the current image. Therefore, Hanami, Yokoyama and Official Notice, alone or in combination, do not appear to teach or suggest that the second position corresponding to a global offset associated with fast moving data in the current image, as presently claimed. As such, the claimed invention is fully patentable over the cited references and the rejections should be withdrawn.

Claim 6 is independently patentable over the cited references. Claim 5 provides that the first circuit further comprises a write control circuit configured to generate a write address to write to the search memory. Claim 6 further provides an internal read control circuit configured to generate a read address to read from the search memory. Since claim 6 depends from claim 5, an obviousness rejection of claim 6 requires the Office show that the references teach or suggest both a write control circuit configured to generate a write address to write to the search

memory and an internal read control circuit configured to generate a second read address to read from the search memory (as well as all of the limitations of intermediate claim 4 and base claim 1). However, the proposed combination of references does not appear to teach or suggest all of the claim limitations when both claims 5 and 6 are considered as a whole.

In particular, column 15 lines 51-55 and FIG. 18 of Hanami appear to teach a different structure than as claimed. In particular, Hanami teaches that a Buffer Memory Read Control Circuit 55f generates a single address for both reads and writes. In contrast, the combination of claims 5 and 6 provide two circuits generating two address signals, one for reads and another for writes. Therefore, Hanami, Yokoyama, Official Notice and Arcoleo, alone or in combination, do not appear to teach or suggest both a write control circuit configured to generate a write address to write to the search memory and an internal read control circuit configured to generate a read address to read from the search memory, as presently claimed. As such, claim 6 is fully patentable over the cited references and the rejection should be withdrawn.

Claims 7 and 19 are independently patentable over the cited references. Claim 7 further provides that the first circuit is further configured to (i) copy a plurality of third reference samples of the first reference image from the external memory and (ii) generate a third motion vector corresponding to a second

current block of the current image by searching among the third reference samples and at least a first portion of the first reference samples, the second current block being horizontally adjoining the first current block in the current image. Claim 19 provides similar language. In contrast, the proposed combination of cited references does not appear to teach or suggest all of the above claim limitations.

In particular, the Office Action argues that (i) the claimed first reference samples are taught by a first block 218 of Topper containing 8x8 current samples, (ii) the claimed third reference samples are taught by a second block 310 of Topper containing 8x8 current samples and (iii) the claimed second current block is taught by a block 220 of Topper containing 4x4 current samples. However, both of the blocks 218 and 310 of Topper do not contain reference samples as claimed. Per the Office Action, each of the 8x8 block of Topper are searched to find a best-match motion vector. One of ordinary skill in the art would appear to distinguish between the current blocks being searched and the reference samples against which current blocks are compared. The assertion in the Office action that "the large block corresponds with the 'reference samples'" is incorrect. The large 8x8 blocks of Topper clearly correspond to the current samples for which a motion vector is sought.

Furthermore, Topper appears to be silent regarding the large 8x8 blocks being copied from a reference image. In particular, FIG. 3B of Topper illustrates the 8x8 blocks 218 and 310 as part of a current image 210. FIGS. 1A and 6 of Topper also shows that the current image 210 is copied from a current field memory 110. In contrast, the reference image of Topper is copied from a prior field memory 112. Therefore, Hanami, Yokoyama, Official Notice and Topper, alone or in combination, do not appear to teach or suggest that the first circuit is further configured to (i) copy a plurality of third reference samples of the first reference image from the external memory and (ii) generate a third motion vector corresponding to a second current block of the current image by searching among the third reference samples and at least a first portion of the first reference samples, the second current block being horizontally adjoining the first current block in the current image. As such, claims 7 and 19 are fully patentable over the cited references and the rejections should be withdrawn.

Claims 9 and 14 are independently patentable over the cited references. Claim 9 further provides that the third reference samples are spatially adjoining the first reference samples in the first reference image. Claim 14 provides similar language. The Office Action asserts that the above claim limitations are taught by FIG. 4B of Topper. In contrast, FIG. 4B

of Topper shows the current image 210 for which motion vectors are sought, not a reference image against which the current image 210 is compared. The rest of Topper appears to be silent regarding both first reference samples and spatially adjoining third reference samples. Hanami, Yokoyama and Official Notice do not appear to cure the deficiency of Topper. Therefore, Hanami, Yokoyama, Official Notice and Topper, alone or in combination, do not appear to teach or suggest that the third reference samples are spatially adjoining the first reference samples in the first reference image, as presently claimed. As such, claim 9 and 14 are fully patentable over the cited references and the rejections should be withdrawn.

Claims 15 and 26 are independently patentable over the cited references. Claim 15 further provides that the steps of generating the first motion vector and copying the third reference samples are performed substantially simultaneously. New claim 26 provides similar language. The Office Action argues that Topper teaches that each time a new field is received in the current field memory 110, the field stored in the current field memory 110 is transferred to the prior field memory 112. However, the above assertion has nothing to do with the claim. The claim involves two actions being performed substantially simultaneously, neither of which involves the creation of a new reference image. Even assuming, *arguendo*, that the copying of Topper from the current

field memory 110 to the prior field memory 112 is somehow considered similar to the claimed copying of third reference samples from the external memory to the search memory (for which Applicants' representative does not necessarily agree), no motion vector searches can be performed until the copying is complete. In such a light, Topper appears to teach sequential steps, not substantially simultaneous steps. Therefore, Hanami, Yokoyama, Official Notice and Topper, alone or in combination, do not appear to teach or suggest that the steps of generating the first motion vector and copying the third reference samples are performed substantially simultaneously, as presently claimed. As such, claims 15 and 21 are fully patentable over the cited references, the rejection of claim 15 should be withdrawn and new claim 26 should be allowed.

Claims 16 and 27 are independently patentable over the cited references. Claim 16 further provides (i) overwriting some of the first reference samples with a plurality of fourth reference samples of the first reference image copied from the memory and (ii) generating a fourth motion vector corresponding to a third current block of the current image by searching among the fourth reference samples, the third reference samples and at least a second portion of the first reference samples, the third current block being horizontally adjoining the second current block in the current image. New claim 27 provides similar language. In

contrast, the proposed combination of the references does not appear to teach or suggest all of the above claim limitations.

In particular, the Office Action argues that (i) the block 410 of Topper teaches the claimed fourth reference samples and (ii) the block 412 of Topper teaches the claimed third current block. However, per FIG. 4A of Topper, the samples in the block 410 appear to be part of the current image 210, which is not a reference image. Furthermore, block 412 of Topper is not horizontally adjoining the second current block. Therefore, Hanami, Yokoyama, Official Notice and Topper, alone or in combination, do not appear to teach or suggest overwriting some of the first reference samples with a plurality of fourth reference samples of the first reference image copied from the memory and generating a fourth motion vector corresponding to a third current block of the current image by searching among the fourth reference samples, the third reference samples and at least a second portion of the first reference samples, the third current block being horizontally adjoining the second current block in the current image, as presently claimed. As such, claims 16 and 27 are fully patentable over the cited references, the rejection of claim 16 should be withdrawn and new claim 27 should be allowed.

Claims 2, 4-7, 9, 10, 14-16, 19 and 21-25 depend, either directly or indirectly, from claims 1 and 11, which are now believed to be allowable. Claim 13 has been cancelled. As such,

the dependent claims are fully patentable over the cited references and the rejections should be withdrawn.

New claims 26 and 27 depend, either directly or indirectly, from claims 1 and 11, which are now believed to be allowable. As such, the new claims are fully patentable over the cited references and should be allowed.

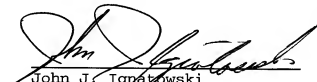
Accordingly, the present application is in condition for allowance. Early and favorable action by the Examiner is respectfully solicited.

The Examiner is respectfully invited to call the Applicants' representative between the hours of 9 a.m. and 5 p.m. ET at 586-498-0670 should it be deemed beneficial to further advance prosecution of the application.

If any additional fees are due, please charge Deposit Account No. 12-2252.

Respectfully submitted,

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LSI Corporation

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